Inspection Report For Well: UT20736 - 06700

U.S. Environmental Protection Agency
Underground Injection Control Program, 8ENF-T
999 18th Street, Suite 300, Denver, CO 80202-2466

This form was printed on 9/24/2013

INSPECTOR(S): Lead: Roberts, Sarah — Date: 10/11/2013 (12)
Others: Ajayi, Christopher — Time: 10:00 am / pm

OPERATOR (only if different): _____

REPRESENTATIVE(S): Chad Stevinson

PRE-INSPECTION REVIEW

Petroglyph Operating Company, Inc

Well Name:	Ute Tribal 18-01		
Well Type:	Enhanced Recovery (2R)		
Operating Status:	AC (ACTIVE) as of 7/10/2006		
Oil Field:	Antelope Creek (Duchesne)		
Location:	NENE S18 T5S R3W		
Indian Country:	X, Uintah and Ouray		
Last Inspection:	8/29/2012	***Allowable Inj Pressure:***	1470 /
Last MIT:	Pass 5/20/2011	***Annulus Pressure From Last MIT:***	900

BLACK = POSSIBLE VIOLATION GREY = DATA MISSING

INSPECTION TYPE: (Select One)
- ☐ Construction / Workover
- ☐ Plugging
- ☐ Post-Closure
- ☐ Response to Complaint
- ☒ Routine
- ☐ Witness MIT
- ☐ Other

ICIS Entered
Date 12/31/13
Initials RB

OBSERVED VALUES:

Tubing Gauge:	☒ Yes ☐ No	Pressure: U: 1393 / L: ____ psig	Gauge Range: Scada psig	Gauge Owner:	☐ EPA ☒ Operator
Annulus Gauge:	☒ Yes ☐ No	Pressure: 0 psig	Gauge Range: opened psig	Gauge Owner:	☒ EPA ☐ Operator
Bradenhead Gauge:	☐ Yes ☐ No	Pressure: ____ psig	Gauge Range: ____ psig	Gauge Owner:	☐ EPA ☐ Operator
Pump Gauge:	☐ Yes ☐ No	Pressure: ____ psig	Gauge Range: ____ psig	Gauge Owner:	☐ EPA ☐ Operator

Operating Status: (Select One)
- ☒ Active
- ☐ Being Reworked
- ☐ Not Injecting
- ☐ Production
- ☐ Plugged and Abandoned
- ☐ Under Construction

U2 Entered
Date 12/17/13
Initial RB

See page 2 for photos, comments, and site conditions.

GREEN | BLUE | CB
TA | 1

Inspection Report For Well: UT20736 - 06700 (PAGE 2)

PHOTOGRAPHS: ☐ Yes ☒ No List of photos taken: _____

Comments and site conditions observed during inspection: _____

GPS: GPS File ID: _____

Signature of EPA Inspector(s): _____ _____

☐ Data Entry ☐ Compliance Staff ☐ Hard Copy Filing

NOTICE OF INSPECTION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII, 999 18TH STREET - SUITE 500
DENVER, COLORADO 80202-2405

Date: 12/16/13
Hour: 8:00a

Notice of inspection is hereby given according to Section 1445(b) of the Safe Drinking Water Act (42 U.S.C. §300f et seq.).

Firm Name: Petroglyph Operating, Inc.

Firm Address: Roosevelt, UT, Antelope Creek Oil Field

REASON FOR INSPECTION:

For the purpose of inspecting records, files, papers, processes, controls and facilities, and obtaining samples to determine whether the person subject to an applicable underground injection control program has acted or is acting in compliance with the Safe Drinking Water Act and any applicable condition of permit or rule authorization.

SECTION 1445(b) of the SAFE DRINKING WATER ACT is quoted below:

Section 1445(b)(1): Except as provided in Paragraph (2), the Administrator, or representatives of the Administrator duly designated by him, upon presenting appropriate credentials, and a written notice to any supplier of water or other person subject to (a), or person subject (A) a national primary drinking water regulation prescribed under Section 1412(B) an applicable Underground Injection Control Program, or (C) any requirement to monitor an unregulated contaminant pursuant to subsection (a), or person in charge of any of the property of such supplier or other person referred to in clause (A), (B), or (C), is authorized to enter any establishment, ... facility, or other property of such supplier or other person in order to determine whether such supplier or other person has acted or is acting in compliance with this title, including for this purpose, inspection, at reasonable times, of records, files, papers, processes, controls, and facilities, or in order to test any feature of a public water system, including its raw water source. The Administrator or the Comptroller General (or any representative designated by either) shall have access for the purpose of audit and examination to any records, reports, or information of a grantee which are required to be maintained under subsection (a) or which are pertinent to any financial assistance under this title.

Sarah Roberts
Inspector's Name & Title (Print)

Inspector's Signature

EPA R8 3560-1 (8-89)

Original - Regional Office Copy
Yellow Copy - Operator Copy

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
999 18TH STREET - SUITE 300
DENVER, CO 80202-2466
Phone 800-227-8917
http://www.epa.gov/region08

APR 17 2006

Ref: 8P-W-GW

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Steve Wall, District Manager
Petroglyph Energy, Inc.
4116 West 3000 So. Ioka Lane
Roosevelt, UT 84066

RE: Additional Well to Antelope Creek Area Permit
UIC Permit No. UT20736-00000
Well ID: UT20736-06700
Ute Tribal No.18-01, Duchesne County, Utah

Dear Mr. Wall:

The Petroglyph Operating Company, Inc. (Petroglyph) request to convert the former Green River Formation oil well Ute Tribal No.18-01 to an enhanced recovery injection well in the Antelope Creek Waterflood project is hereby authorized by the Environmental Protection Agency (EPA) under the terms and conditions of the Authorization For Additional Well.

The addition of the proposed injection well, within the exterior boundary of the Uintah & Ouray Indian Reservation, is being made under the authority of 40 CFR §144.33 (c) and terms of the Antelope Creek Waterflood UIC Area Permit No. UT20736-00000. Unless specifically mentioned in the enclosed Authorization For Additional Well, the Ute Tribal No.18-01 is subject to all terms and conditions of the UIC Area Permit UT20736-00000 as modified.

Please be aware that Petroglyph does not have authorization to begin injection operations into the well until all Prior to Commencing Injection requirements have been submitted and evaluated by the EPA, and Petroglyph has received written authorization from the Director to begin injection.

Prior to receiving authorization to inject, the EPA requires that Petroglyph submit for review and approval the following: (1) the results of a **Part I (Internal) mechanical integrity test** (MIT), (2) a **pore pressure** calculation of the injection interval, (3) a completed **EPA Form No. 7520-12** Well Rework Record.

The initial Maximum Allowable Injection Pressure (MAIP) for the Ute Tribal No.18-01 was determined to be **1470 psig.** UIC Area Permit UT20736-00000 also provides the opportunity for the permittee to request a change in the MAIP based upon results of a step rate test that demonstrates that the formation breakdown pressure will not be exceeded.

If you have any questions, please call Ms. Tricia Pfeiffer at (303) 312-6271 or 1.800.227.8917 (Ext. 6271). Please submit the required data to **ATTENTION: Tricia Pfeiffer**, at the letterhead address, citing **MAIL CODE: 8P-W-GW** very prominently.

Sincerely,

for Stephen S. Tuber
Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

encl: Authorization For Conversion of An Additional Well
EPA Form No. 7520-12 (Well Rework Record)

cc: without enclosures

Maxine Natchees, Acting Chairperson
Uintah & Ouray Business Committee
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, UT 84026

Chester Mills, Superintendent
BIA - Uintah & Ouray Indian Agency
P.O. Box 130
Fort Duchesne, UT 84026

cc: with enclosures

Mr. Kenneth Smith
Executive Vice President and Chief Operating Officer
Petroglyph Energy, Inc.
555 S. Cole Blvd
Boise, ID 83709

S. Elaine Willie
Environmental Coordinator
Ute Indian Tribe
P.O. Box 460
Fort Duchesne, UT 84026

Gilbert Hunt
Technical Services Manager
Utah Division of Oil, Gas, and Mining
1594 West North Temple - Suite 1220
Salt Lake City, UT 84114-5801

Fluid Minerals Engineering Office
U.S. Bureau of Land Management-Vernal Field Office
170 South 500 East
Vernal, Utah 84078

bcc w/o enclosures:

Barbara Conklin, 8TAP
Nathan Wiser, 8 ENF-UFO

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to: UT-20736-06700

Steve Wall, District Manager
Petroglyph Energy, Inc.
4116 West 3000 So. Ioka Lane
Roosevelt, UT 84066

A

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (*Printed Name*) C. Date of Delivery 4-20-06

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

RECEIVED
APR 25 2006
EPA Region 8
Ground Water Program

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (*Extra Fee*) ☐ Yes

2. Article Number (*Transfer from service label*) 7001 0320 0005 9389 3163

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

OFFICIAL USE

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Postmark Here

7001 0320 0005 9389 3163

Sent To
Street, Apt. No.; or PO Box No.
City, State, ZIP+4

Steve Wall, District Manager
Petroglyph Energy, Inc.
4116 West 3000 So. Ioka Lane
Roosevelt, UT 84066

PS Form 3800, January 2001 See Reverse for Instructions

OMB No. 2040-0042 Approval Expires 11/30/2014

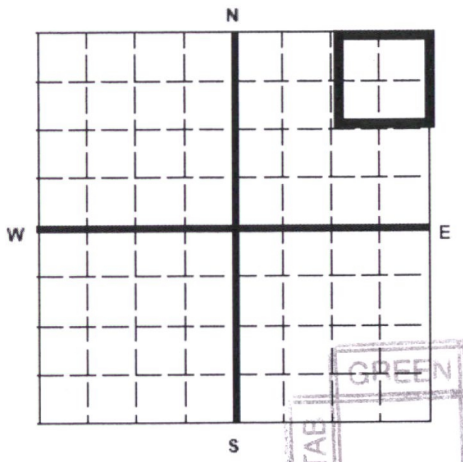
United States Environmental Protection Agency
Washington, DC 20460

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee
Petroglyph Operating Company, Inc. 2258
P.O. Box 7608
Boise, Idaho 83709

Name and Address of Surface Owner
Ute Indian Tribe
P.O. Box 70
Ft. Duchesne, Utah, 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT20736-06700

Surface Location Description
___ 1/4 of ___ 1/4 of NE 1/4 of NE 1/4 of Section 18 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 550 ft. frm (N/S) N Line of quarter section
and 521 ft. from (E/W) E Line of quarter section.

U2 Entered
Date 4/3/17
Initial JB

WELL ACTIVITY
- [ ] Brine Disposal
- [X] Enhanced Recovery
- [ ] Hydrocarbon Storage

TYPE OF PERMIT
- [ ] Individual
- [X] Area

Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 18-01

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	16	1306	1441	779		0	0
February	16	1406	1416	1119		0	0
March	16	1431	1437	1147		0	0
April	16	1397	1436	992		0	0
May	16	1365	1401	1048		0	0
June	16	1225	1339	803		0	0
July	16	1375	1389	1096		0	0
August	16	1421	1425	1170		0	0
September	16	1414	1424	1135		0	0
October	16	1396	1415	1240		0	0
November	16	1364	1381	1195		0	0
December	16	1348	1368	1296		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		03/21/2017

EPA Form 7520-11 (Rev. 12-11)

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Vernal, UT 84078

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Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 18-01 INJ, DUCHESNE**	Lab Tech:	**Kaitlyn Natelli**
Sample Point:	**Well Head**		
Sample Date:	**1/6/2017**		
Sample ID:	**WA-345377**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics

Test Date:	**1/23/2017**
System Temperature 1 (°F):	**300**
System Pressure 1 (psig):	**2000**
System Temperature 2 (°F):	**130**
System Pressure 2 (psig):	**50**
Calculated Density (g/ml):	**1.0022**
pH:	**8.30**
Calculated TDS (mg/L):	**7200.30**
CO_2 in Gas (%):	
Dissolved CO_2 (mg/L)):	**0.00**
H_2S in Gas (%):	
H2S in Water (mg/L):	**5.00**
Tot. SuspendedSolids(mg/L):	
Corrosivity(LanglierSat.Indx)	**0.00**
Alkalinity:	

Analysis @ Properties in Sample Specifics

Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	**2467.56**	Chloride (Cl):	**3000.00**
Potassium (K):	**20.07**	Sulfate (SO_4):	**40.00**
Magnesium (Mg):	**17.60**	Bicarbonate (HCO_3):	**1586.00**
Calcium (Ca):	**35.80**	Carbonate (CO_3):	
Strontium (Sr):	**3.32**	Hydroxide(HO):	
Barium (Ba):	**8.46**	Acetic Acid (CH_3COO)	
Iron (Fe):	**3.99**	Propionic Acid (C_2H_5COO)	
Zinc (Zn):	**0.57**	Butanoic Acid (C_3H_7COO)	
Lead (Pb):	**0.00**	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Ammonia NH_3:		Fluoride (F):	
Manganese (Mn):	**0.12**	Bromine (Br):	
Aluminum (Al):	**0.16**	Silica (SiO_2):	**16.81**
Lithium (Li):	**2.75**	Calcium Carbonate ($CaCO_3$):	
Boron (B):	**3.65**	Phosphates (PO_4):	**11.80**
Silicon (Si):	**7.86**	Oxygen (O_2):	

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
130.00	50.00	1.37	27.87	0.96	4.40	3.21	2.20	2.50	2.89	0.00	0.00	0.00	0.00	0.00	0.00	9.92	0.30
149.00	267.00	1.43	28.32	0.86	4.24	3.15	2.20	2.60	2.90	0.00	0.00	0.00	0.00	0.00	0.00	9.66	0.30
168.00	483.00	1.51	28.92	0.79	4.10	3.13	2.20	2.70	2.90	0.00	0.00	0.00	0.00	0.00	0.00	9.45	0.30
187.00	700.00	1.60	29.45	0.73	3.98	3.14	2.20	2.80	2.90	0.00	0.00	0.00	0.00	0.00	0.00	9.26	0.30
206.00	917.00	1.70	29.89	0.69	3.89	3.16	2.20	2.89	2.90	0.00	0.00	0.00	0.00	0.00	0.00	9.10	0.30
224.00	1133.00	1.81	30.26	0.67	3.82	3.20	2.20	2.98	2.90	0.00	0.00	0.00	0.00	0.00	0.00	8.96	0.30
243.00	1350.00	1.92	30.54	0.66	3.79	3.26	2.20	3.07	2.90	0.00	0.00	0.00	0.00	0.00	0.00	8.84	0.30
262.00	1567.00	2.03	30.76	0.66	3.79	3.33	2.20	3.14	2.90	0.00	0.00	0.00	0.00	0.00	0.00	8.73	0.30
281.00	1783.00	2.15	30.92	0.66	3.81	3.41	2.20	3.21	2.90	0.00	0.00	0.00	0.00	0.00	0.00	8.64	0.30
300.00	2000.00	2.27	31.04	0.68	3.85	3.50	2.20	3.28	2.90	0.00	0.00	0.00	0.00	0.00	0.00	8.56	0.30

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Vernal, UT 84078

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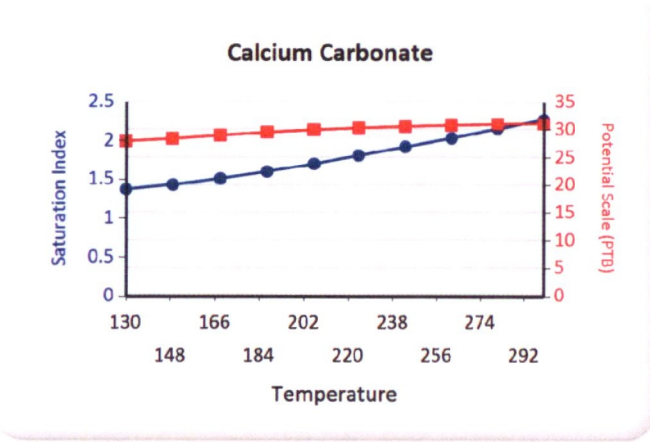
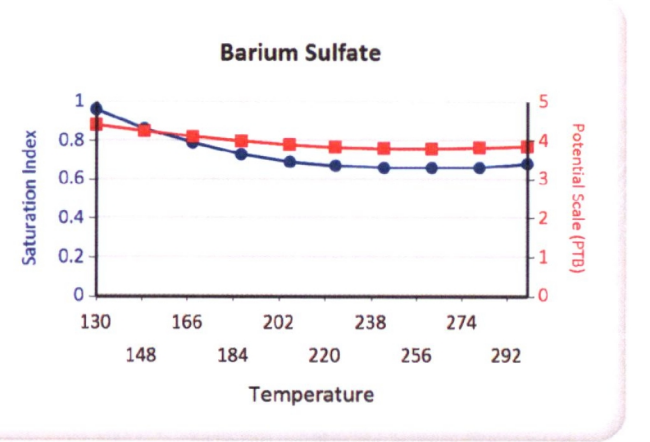
Water Analysis Report

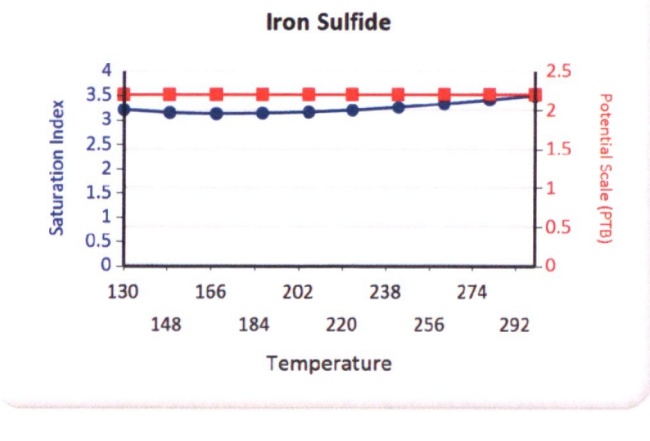
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
130.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32	0.36	0.00	0.00	3.09	16.14	1.44	9.03	9.08	3.10
149.00	267.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53	0.37	0.00	0.00	3.83	19.70	1.84	11.34	9.54	3.10
168.00	483.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72	0.38	0.00	0.00	4.63	23.74	2.29	14.06	10.08	3.10
187.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	1.91	0.38	0.00	0.00	5.43	27.31	2.75	16.58	10.64	3.10
206.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	2.07	0.38	0.00	0.00	6.21	30.17	3.20	18.71	11.20	3.10
224.00	1133.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.38	0.00	0.00	6.98	32.24	3.64	20.29	11.76	3.10
243.00	1350.00	0.00	0.00	0.00	0.00	0.00	0.00	2.35	0.38	0.00	0.00	7.72	33.56	4.08	21.34	12.32	3.10
262.00	1567.00	0.00	0.00	0.00	0.00	0.00	0.00	2.46	0.38	0.00	0.00	8.44	34.33	4.51	21.97	12.86	3.10
281.00	1783.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56	0.38	0.00	0.00	9.13	34.74	4.92	22.31	13.39	3.10
300.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	2.64	0.38	0.00	0.00	9.79	34.95	5.31	22.50	13.90	3.10

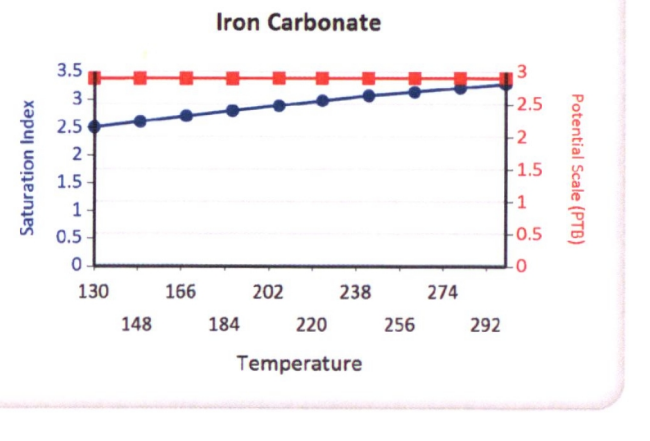
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

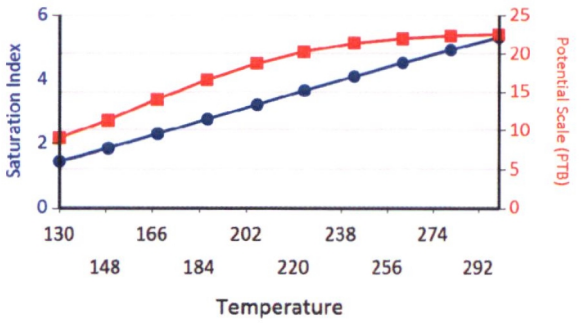




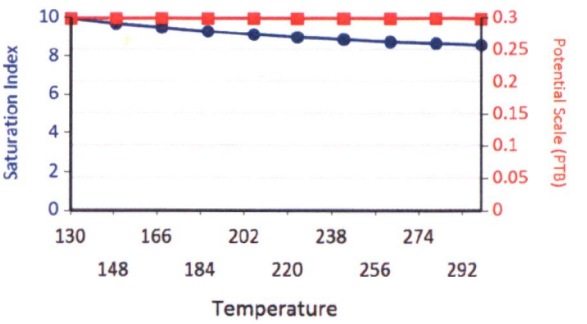




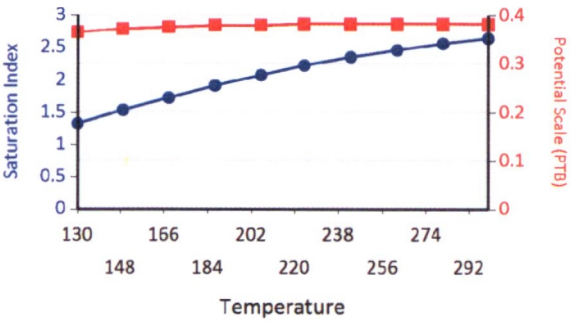
Ca Mg Silicate



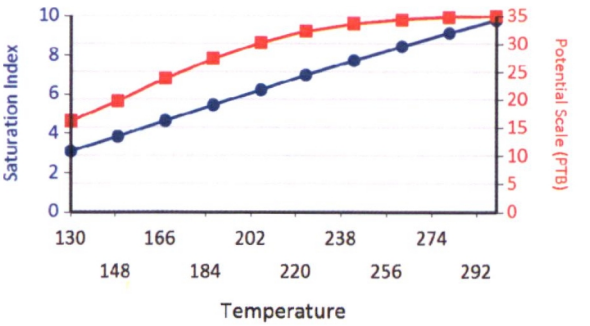
Zinc Sulfide



Zinc Carbonate



Mg Silicate



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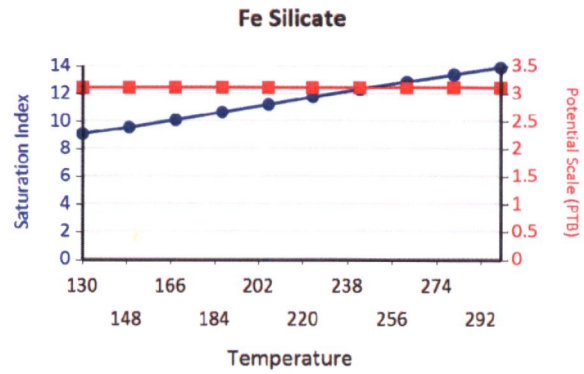


OMB No. 2040-0042 Approval Expires 11/30/2014

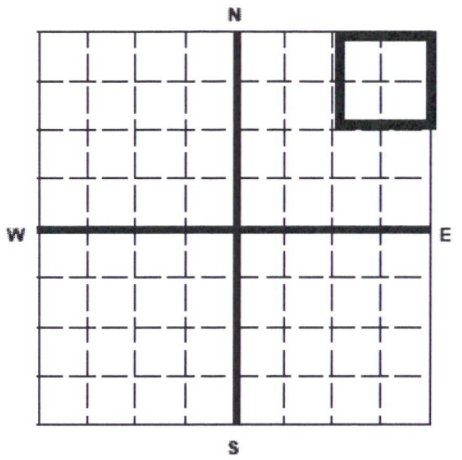
United States Environmental Protection Agency
Washington, DC 20460

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee
Petroglyph Operating Company, Inc. 2258
P.O. Box 7608
Boise, Idaho 83709

Name and Address of Surface Owner
Ute Indian Tribe
P.O. Box 70
Ft. Duchesne, Utah, 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT2736-~~04494~~ 06700

Surface Location Description
___ 1/4 of ___ 1/4 of NE 1/4 of NE 1/4 of Section 18 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 550 ft. frm (N/S) N Line of quarter section
and 521 ft. from (E/W) E Line of quarter section.

U2 Entered
Date 3/1/16
Initial DB

WELL ACTIVITY	TYPE OF PERMIT
[ ] Brine Disposal	[ ] Individual
[X] Enhanced Recovery	[X] Area
[ ] Hydrocarbon Storage	Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 18-01

MONTH	YEAR	INJECTION PRESSURE AVERAGE PSIG	INJECTION PRESSURE MAXIMUM PSIG	TOTAL VOLUME INJECTED BBL	TOTAL VOLUME INJECTED MCF	TUBING – CASING ANNULUS PRESSURE (OPTIONAL MONITORING) MINIMUM PSIG	TUBING – CASING ANNULUS PRESSURE (OPTIONAL MONITORING) MAXIMUM PSIG
January	15	1374	1384	1621		0	0
February	15	1381	1396	1339		0	0
March	15	1403	1417	1749		0	0
April	15	1398	1406	1855		0	0
May	15	1393	1404	2000		0	0
June	15	1399	1418	2007		0	0
July	15	1412	1428	2155		0	0
August	15	1416	1437	2005		0	0
September	15	1396	1428	1827		0	0
October	15	1416	1424	1966		0	0
November	15	1415	1436	1657		0	0
December	15	1366	1432	976		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		02/08/2016

GREEN BLUE CBI
TAB 2

EPA Form 7520-11 (Rev. 12-11)

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

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Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 18-01 INJ, DUCHESNE**	Lab Tech:	**Michele Pike**
Sample Point:	**Well Head**		
Sample Date:	**1/6/2016**		
Sample ID:	**WA-327561**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics

Test Date:	1/14/2016
System Temperature 1 (°F):	60
System Pressure 1 (psig):	2000
System Temperature 2 (°F):	180
System Pressure 2 (psig):	50
Calculated Density (g/ml):	1.0021
pH:	7.70
Calculated TDS (mg/L):	6888.90
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	0.00
Tot. SuspendedSolids(mg/L):	
Corrosivity(LanglierSat.Indx)	0.00
Alkalinity:	

Analysis @ Properties in Sample Specifics

Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	2214.09	Chloride (Cl):	3000.00
Potassium (K):	12.19	Sulfate (SO_4):	430.00
Magnesium (Mg):	62.96	Bicarbonate (HCO_3):	976.00
Calcium (Ca):	140.46	Carbonate (CO_3):	
Strontium (Sr):	5.94	Acetic Acid (CH_3COO)	
Barium (Ba):	1.09	Propionic Acid (C_2H_5COO)	
Iron (Fe):	13.88	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	3.30	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.60	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.07	Silica (SiO_2):	28.32
Aluminum (Al):	0.05	Calcium Carbonate ($CaCO_3$):	
Lithium (Li):	0.72	Phosphates (PO_4):	7.44
Boron (B):	1.20	Oxygen (O_2):	
Silicon (Si):	13.24		

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180.00	50.00	1.51	88.08	0.83	0.55	0.00	0.00	2.64	10.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
167.00	267.00	1.37	79.29	0.85	0.56	0.00	0.00	2.47	10.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153.00	483.00	1.27	73.32	0.88	0.56	0.00	0.00	2.35	10.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140.00	700.00	1.18	67.36	0.92	0.57	0.00	0.00	2.22	10.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
127.00	917.00	1.09	61.54	0.97	0.58	0.00	0.00	2.10	9.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113.00	1133.00	1.00	55.95	1.03	0.59	0.00	0.00	1.98	9.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	1350.00	0.93	50.70	1.11	0.60	0.00	0.00	1.86	9.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87.00	1567.00	0.85	45.86	1.20	0.61	0.00	0.00	1.74	9.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73.00	1783.00	0.79	41.47	1.31	0.62	0.00	0.00	1.62	9.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.00	2000.00	0.73	37.58	1.43	0.62	0.00	0.00	1.51	9.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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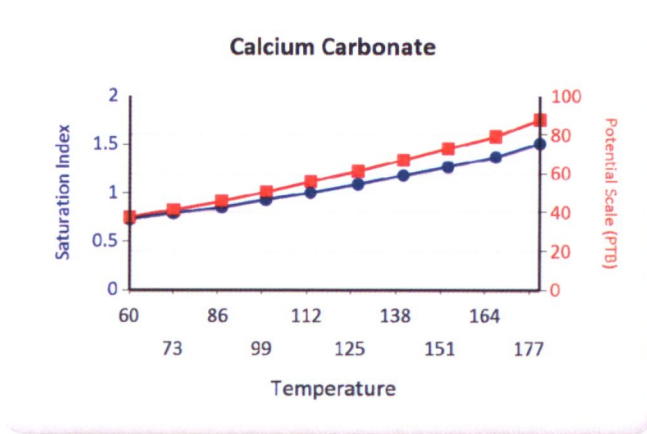
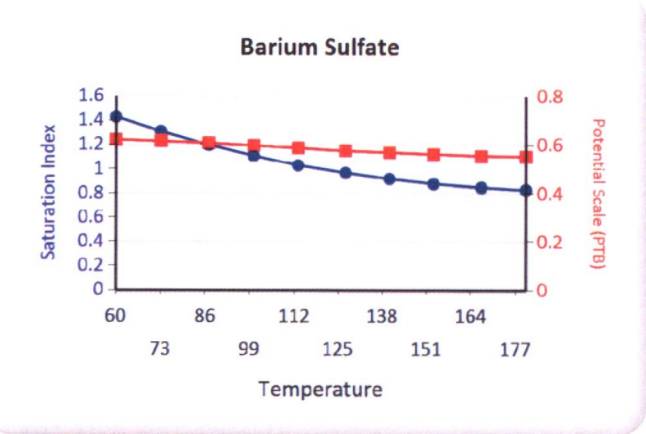
Water Analysis Report

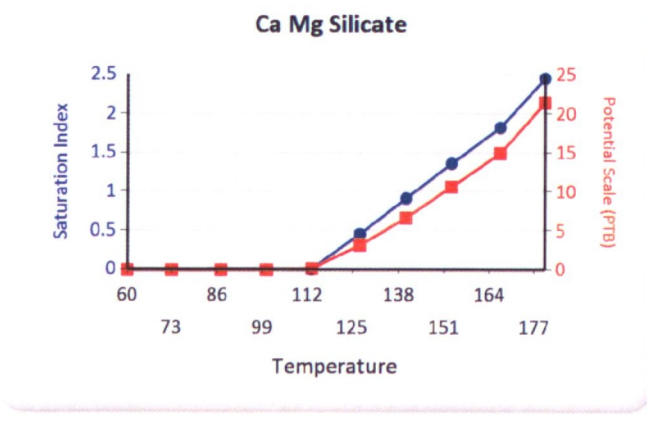
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99	2.19	0.00	0.00	4.61	41.80	2.45	21.48	9.80	10.78
167.00	267.00	0.00	0.00	0.00	0.00	0.00	0.00	1.77	2.18	0.00	0.00	3.59	29.75	1.82	15.00	8.94	10.76
153.00	483.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	2.16	0.00	0.00	2.83	21.81	1.36	10.68	8.34	10.74
140.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40	2.12	0.00	0.00	2.06	14.67	0.91	6.71	7.75	10.70
127.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	2.07	0.00	0.00	1.29	8.45	0.45	3.17	7.16	10.64
113.00	1133.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	1.98	0.00	0.00	0.52	3.17	0.00	0.09	6.59	10.55
100.00	1350.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	1.82	0.00	0.00	0.00	0.00	0.00	0.00	6.03	10.42
87.00	1567.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	1.55	0.00	0.00	0.00	0.00	0.00	0.00	5.48	10.22
73.00	1783.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	1.08	0.00	0.00	0.00	0.00	0.00	0.00	4.94	9.94
60.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.25	0.00	0.00	0.00	0.00	0.00	0.00	4.42	9.55

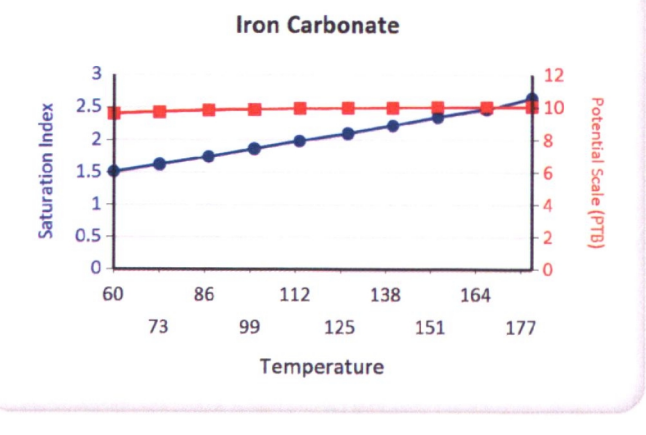
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate Zinc Carbonate Fe Silicate









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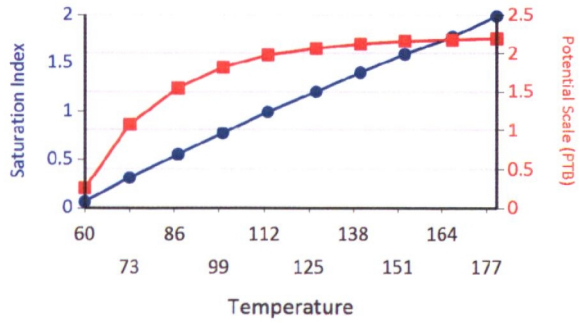
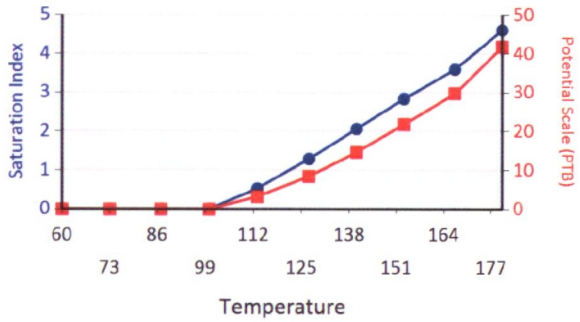
Water Analysis Report

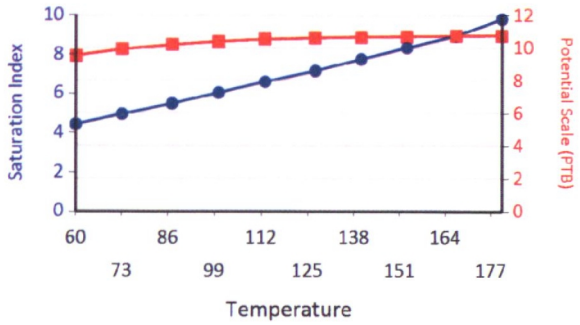
Zinc Carbonate



Mg Silicate



Fe Silicate



UT20736-06100

Mechanical Integrity Test
Tubing/Casing Annulus Pressure Test

U.S. Environmental Protection Agency
Underground Injection Control Program
1595 Wynkoop Street, Denver, CO 80202

EPA Witness: _____ Date: 5/18/16

Test conducted by: CHAD STEVENSON

Others present: _____

Well Name: 18-01 Type: ER SWD **Status:** AC TA UC

Field: ANTELOPE CREEK

Location: 18-01 Sec: ____ T ____ N / S R ____ E / W County: DUCHESNE State: UT

Operator: PETROGLYPH ENERGY

Last MIT: ____ / ____ / ____ **Maximum Allowable Pressure:** _____ **PSIG**

Regularly scheduled test? [X] Yes [ ] No
Initial test for permit? [ ] Yes [ ] No
Test after well rework? [ ] Yes [ ] No

Well injecting during test? If Yes, rate: 31 **bpd**

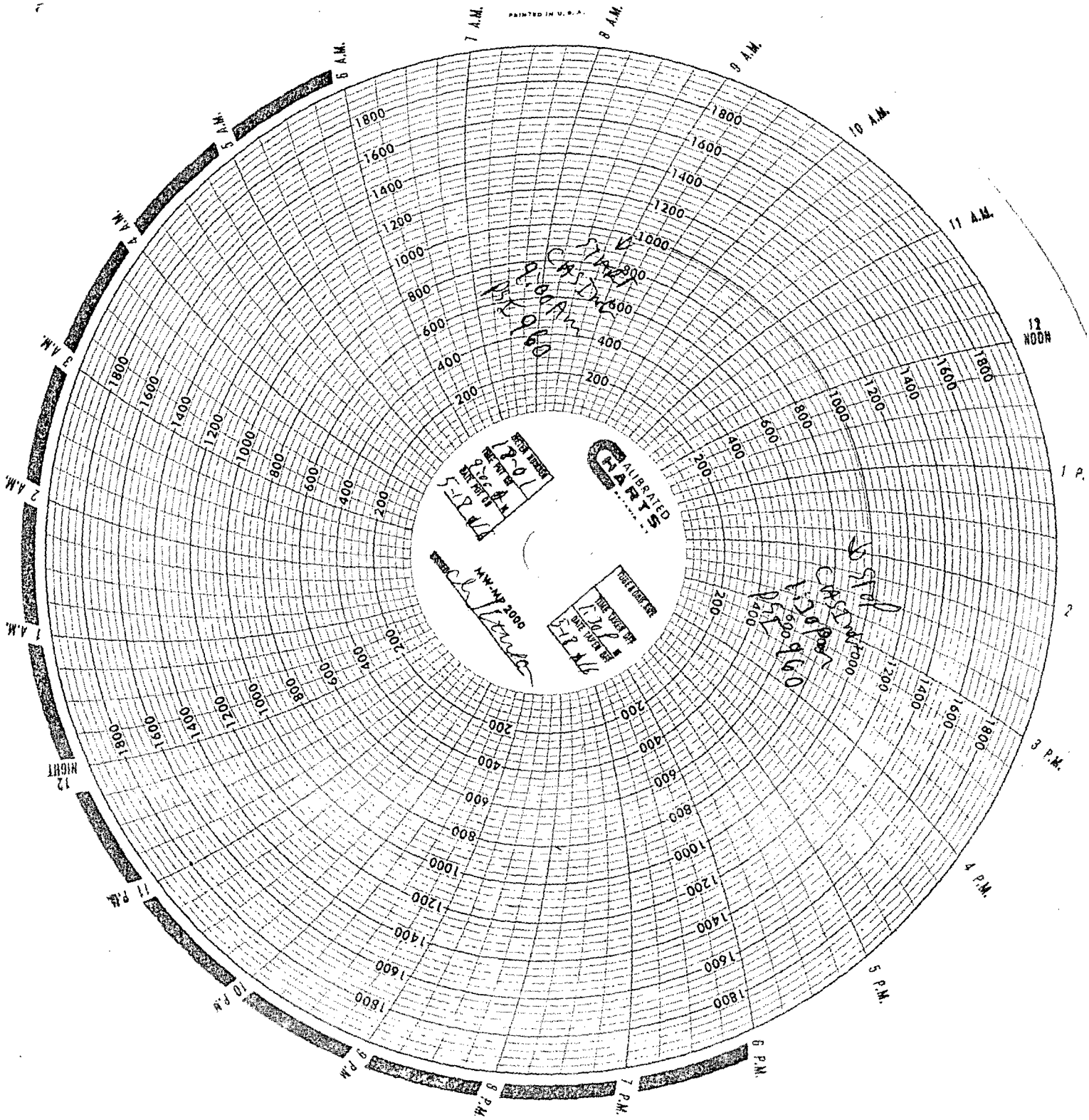
Pre-test annulus pressure: _____ **psig**

MIT DATA TABLE	Test #1	Test #2	Test #3
TUBING		**PRESSURE RECORD**	
Initial Pressure	1379 psig	psig	psig
End of test pressure	1379 psig	psig	psig
CASING / TUBING ANNULUS		**PRESSURE RECORD**	
0 minutes	960 psig	psig	psig
5 minutes	960 psig	psig	psig
10 minutes	960 psig	psig	psig
15 minutes	960 psig	psig	psig
20 minutes	960 psig	psig	psig
25 minutes	960 psig	psig	psig
30 minutes	960 psig	psig	psig
4 1/2 Hours minutes	960 psig	psig	psig
_____ minutes	psig	psig	psig
RESULT	[ ] Pass [ ] Fail	[ ] Pass [ ] Fail	[ ] Pass [ ] Fail

Does the annulus pressure build back up after the test ? _____ **If Yes,** _____ **psig.**

GREEN | WHITE | CANARY
TAB | | 2 |

UIC Entered
Date 7/29/16
Initial JB


PRINTED IN U. S. A.
CALIBRATED CHARTS
MW-MP 2000
12 NOON
12 NIGHT

OMB No. 2040-0042 Approval Expires 12/31/2011

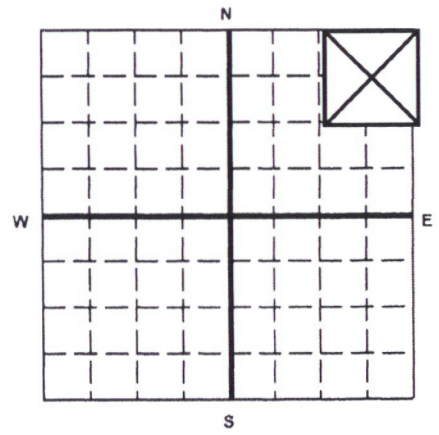
EPA

United States Environmental Protection Agency
Washington, DC 20460

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee	Name and Address of Surface Owner
Petroglyph Operating Company, Inc. 2258 P.O. Box 7608 Boise, Idaho 83709	Ute Indian Tribe P.O. Box 70 Ft. Duchesne, Utah 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT20736-06700

Surface Location Description

___ 1/4 of ___ 1/4 of NE 1/4 of NE 1/4 of Section 18 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 550 ft. frm (N/S) N Line of quarter section and 521 ft. from (E/W) E Line of quarter section.

WELL ACTIVITY	TYPE OF PERMIT
[ ] Brine Disposal	[ ] Individual
[X] Enhanced Recovery	[X] Area
[ ] Hydrocarbon Storage	Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 18-01

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	14	1415	1420	1532		0	0
February	14	1415	1412	1388		0	0
March	14	1329	1404	1249		0	0
April	14	1430	1439	1566		0	0
May	14	1404	1415	1568		0	0
June	14	1396	1395	1514		0	0
July	14	1406	1421	1552		0	0
August	14	1403	1427	1557		0	0
September	14	1399	1417	1652		0	0
October	14	1404	1431	1437		0	0
November	14	1399	1415	1571		0	0
December	14	1394	1398	1656		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		2/10/2015

EPA Form 7520-11 (Rev. 12-08)

U2 Entered
Date 3/23/15
Initial GW

TAB	GREEN	BLUE	CBI
		2	

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

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Units of Measurement: **Standard**

Water Analysis Report

Production Company: **PETROGLYPH OPERATING CO INC - EBUS**
Well Name: **UTE TRIBAL 18-01 INJ, DUCHESNE**
Sample Point: **WELLHEAD**
Sample Date: **1/7/2015**
Sample ID: **WA-297509**

Sales Rep: **James Patry**
Lab Tech: **Gary Winegar**

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	1/14/2015
System Temperature 1 (°F):	160
System Pressure 1 (psig):	1300
System Temperature 2 (°F):	80
System Pressure 2 (psig):	15
Calculated Density (g/ml):	1.0046
pH:	8.30
Calculated TDS (mg/L):	11210.00
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	5.00

Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	3170.91	Chloride (Cl):	6000.00
Potassium (K):	42.06	Sulfate (SO_4):	73.00
Magnesium (Mg):	16.52	Bicarbonate (HCO_3):	1830.00
Calcium (Ca):	28.33	Carbonate (CO_3):	
Strontium (Sr):	5.78	Acetic Acid (CH_3COO)	
Barium (Ba):	15.68	Propionic Acid (C_2H_5COO)	
Iron (Fe):	2.67	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	2.91	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.06	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.13	Silica (SiO_2):	21.95

Notes:
B=6.11 Al=.02 Li=1.73

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4-2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	1.21	21.91	1.70	9.12	3.26	1.47	2.06	1.92	0.00	0.00	0.00	0.00	0.00	0.00	11.39	1.52
88.00	157.00	1.21	21.76	1.61	9.07	3.18	1.47	2.09	1.92	0.00	0.00	0.00	0.00	0.00	0.00	11.20	1.52
97.00	300.00	1.22	21.89	1.54	9.02	3.11	1.47	2.13	1.93	0.00	0.00	0.00	0.00	0.00	0.00	11.03	1.52
106.00	443.00	1.24	22.03	1.47	8.97	3.06	1.47	2.17	1.93	0.00	0.00	0.00	0.00	0.00	0.00	10.88	1.52
115.00	585.00	1.26	22.18	1.40	8.91	3.02	1.47	2.22	1.93	0.00	0.00	0.00	0.00	0.00	0.00	10.73	1.52
124.00	728.00	1.28	22.32	1.34	8.85	2.98	1.47	2.26	1.93	0.00	0.00	0.00	0.00	0.00	0.00	10.60	1.52
133.00	871.00	1.30	22.48	1.29	8.78	2.95	1.47	2.30	1.93	0.00	0.00	0.00	0.00	0.00	0.00	10.47	1.52
142.00	1014.00	1.33	22.63	1.24	8.72	2.93	1.47	2.34	1.93	0.00	0.00	0.00	0.00	0.00	0.00	10.35	1.52
151.00	1157.00	1.35	22.78	1.20	8.65	2.91	1.47	2.38	1.93	0.00	0.00	0.00	0.00	0.00	0.00	10.24	1.52
160.00	1300.00	1.38	22.93	1.16	8.59	2.90	1.47	2.42	1.93	0.00	0.00	0.00	0.00	0.00	0.00	10.14	1.52

		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34	1.86	11.98	0.02	0.45	2.92	0.00	0.00	6.82	2.06
88.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	1.45	1.88	11.67	0.02	0.70	4.20	0.00	0.00	6.91	2.06
97.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	1.90	11.40	0.02	1.07	6.19	0.09	0.87	7.12	2.06
106.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	1.68	1.91	11.15	0.02	1.45	8.16	0.29	2.09	7.34	2.07
115.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	1.79	1.92	10.91	0.02	1.83	10.09	0.50	3.30	7.56	2.07
124.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	1.90	1.93	10.68	0.02	2.22	11.98	0.71	4.48	7.80	2.07
133.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.93	10.46	0.02	2.61	13.81	0.92	5.63	8.05	2.07
142.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	2.09	1.94	10.26	0.02	3.00	15.58	1.14	6.73	8.30	2.07
151.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19	1.94	10.07	0.02	3.39	17.26	1.36	7.77	8.56	2.08
160.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28	1.95	9.89	0.02	3.78	18.83	1.58	8.73	8.82	2.08

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

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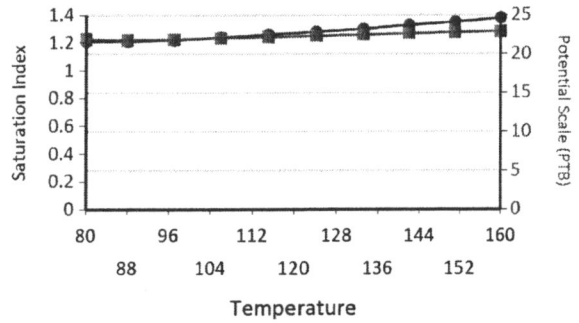
Water Analysis Report

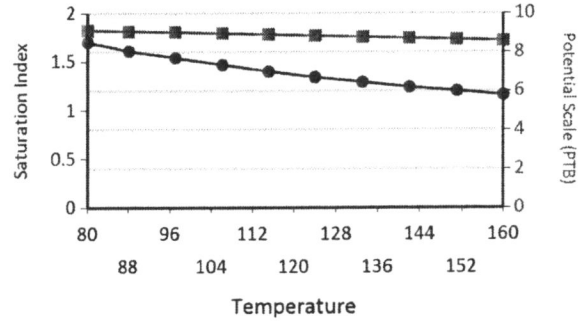
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Ca Mg Silicate Fe Silicate

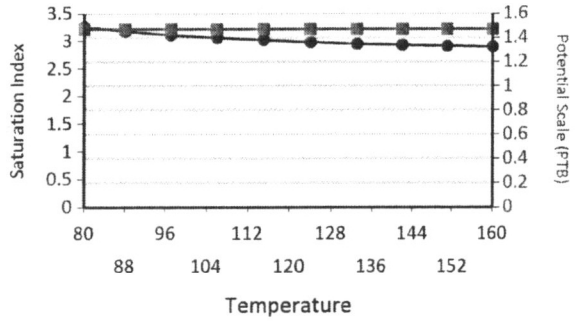
Calcium Carbonate



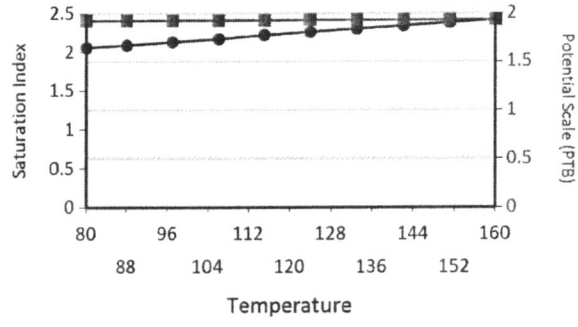
Barium Sulfate



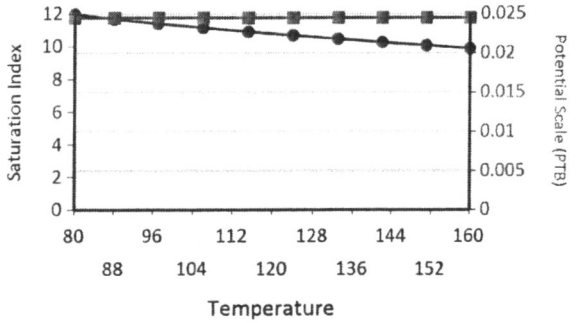
Iron Sulfide



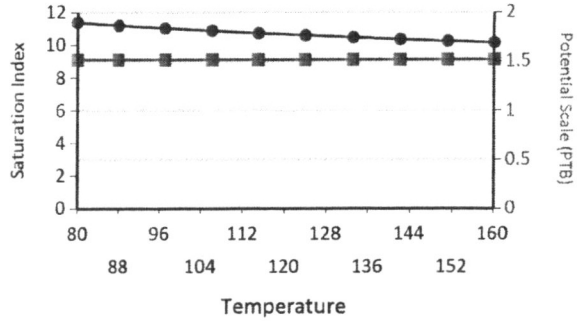
Iron Carbonate



Lead Sulfide



Zinc Sulfide



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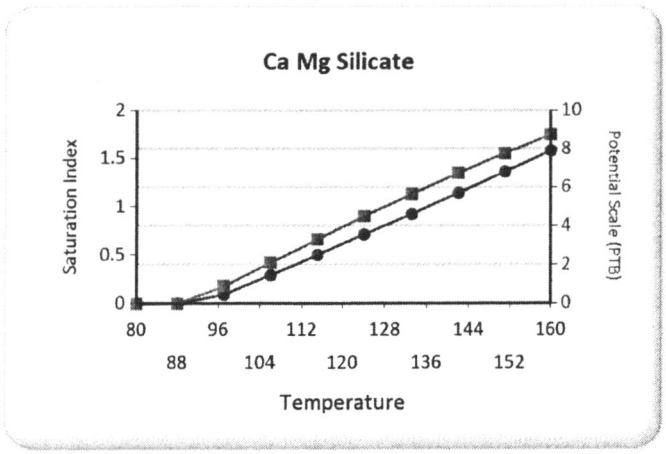
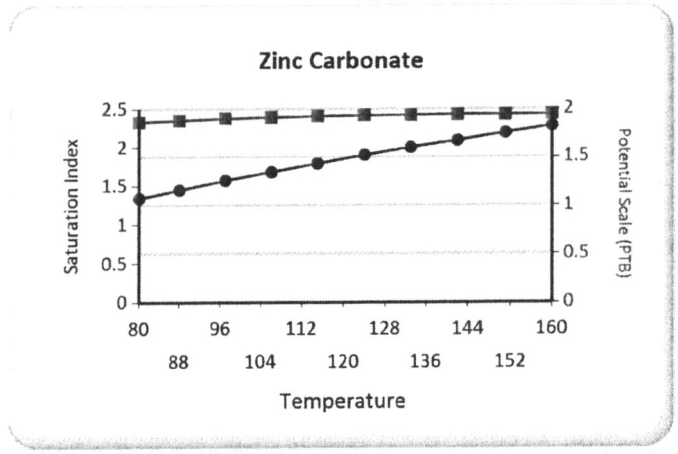
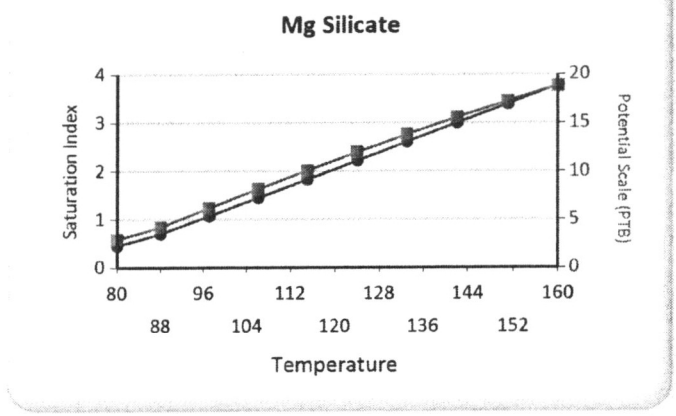
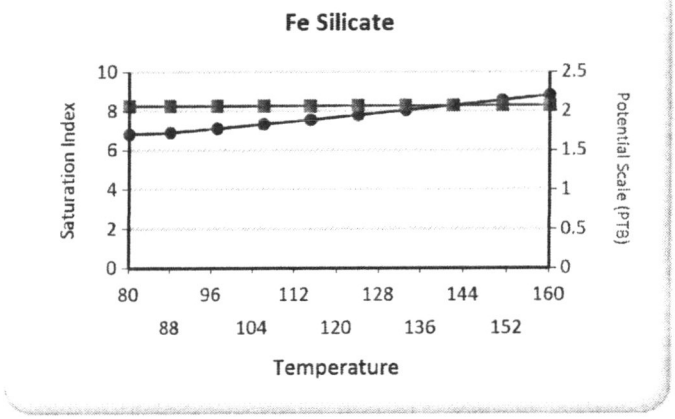








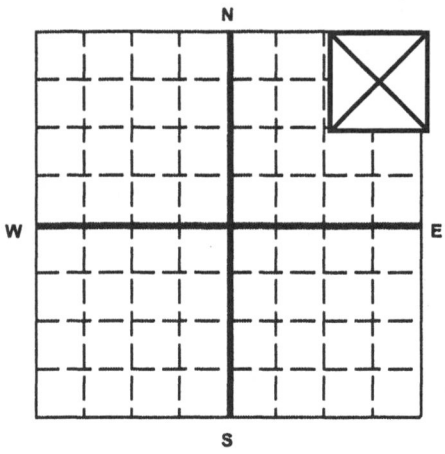
OMB No. 2040-0042 Approval Expires 12/31/2011

United States Environmental Protection Agency
Washington, DC 20460

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee	Name and Address of Surface Owner
Petroglyph Operating Company, Inc. 2258 P.O. Box 7608 Boise, Idaho 83709	Ute Indian Tribe P.O. Box 70 Ft. Duchesne, Utah 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT20736-06700

Surface Location Description

___ 1/4 of ___ 1/4 of NE 1/4 of NE 1/4 of Section 18 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 550 ft. frm (N/S) N Line of quarter section and 521 ft. from (E/W) E Line of quarter section.

WELL ACTIVITY	TYPE OF PERMIT
☐ Brine Disposal	☐ Individual
☒ Enhanced Recovery	☒ Area
☐ Hydrocarbon Storage	Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 18-01

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	13	1371	1406	1065		0	0
February	13	1379	1392	857		0	0
March	13	1373	1369	990		0	0
April	13	1407	1418	1023		0	0
May	13	1367	1428	1025		0	0
June	13	1256	1320	681		0	0
July	13	1387	1424	934		0	0
August	13	1381	1420	991		0	0
September	13	1387	1417	1244		0	0
October	13	1414	1432	1408		0	0
November	13	1409	1413	1444		0	0
December	13	1402	1409	1521		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		2/11/2014

EPA Form 7520-11 (Rev. 12-08)

TAB	GREEN	BLUE	CBI
		2	

~~02 Entered~~
Date 3/20/14
Initial BS

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Units of Measurement: **Standard**

Water Analysis Report

Production Company: **PETROGLYPH ENERGY INC**
Well Name: **UTE TRIBAL 18-01 INJ**
Sample Point: **Wellhead**
Sample Date: **1/8/2014**
Sample ID: **WA-263365**

Sales Rep: **James Patry**
Lab Tech: **Gary Winegar**

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	1/15/2014
System Temperature 1 (°F):	180
System Pressure 1 (psig):	1300
System Temperature 2 (°F):	60
System Pressure 2 (psig):	15
Calculated Density (g/ml):	0.999
pH:	7.10
Calculated TDS (mg/L):	2200.77
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	0.00

Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	96.00	Chloride (Cl):	1000.00
Potassium (K):	3.20	Sulfate (SO_4):	354.00
Magnesium (Mg):	70.00	Bicarbonate (HCO_3):	488.00
Calcium (Ca):	159.00	Carbonate (CO_3):	
Strontium (Sr):	4.00	Acetic Acid (CH_3COO)	
Barium (Ba):	0.30	Propionic Acid (C_2H_5COO)	
Iron (Fe):	5.00	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	0.03	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.00	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.05	Silica (SiO_2):	21.19

Notes:
B=.5 Al=.09 Li=.04

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum $CaSO_4 \cdot 2H_2O$		Celestite $SrSO_4$		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
60.00	14.00	0.29	16.51	1.32	0.17	0.00	0.00	0.51	2.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73.00	157.00	0.27	15.35	1.17	0.17	0.00	0.00	0.54	2.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86.00	300.00	0.32	18.36	1.04	0.16	0.00	0.00	0.65	2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	443.00	0.38	21.77	0.93	0.16	0.00	0.00	0.75	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113.00	585.00	0.45	25.54	0.83	0.15	0.00	0.00	0.86	3.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126.00	728.00	0.52	29.63	0.75	0.15	0.00	0.00	0.97	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140.00	871.00	0.59	33.99	0.68	0.14	0.00	0.00	1.07	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153.00	1014.00	0.67	38.58	0.63	0.14	0.00	0.00	1.18	3.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166.00	1157.00	0.76	43.35	0.58	0.13	0.00	0.00	1.28	3.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.00	1300.00	0.85	48.26	0.55	0.13	0.00	0.00	1.39	3.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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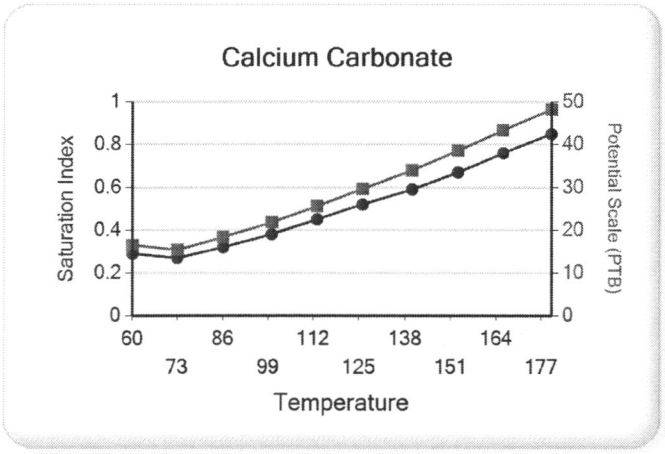
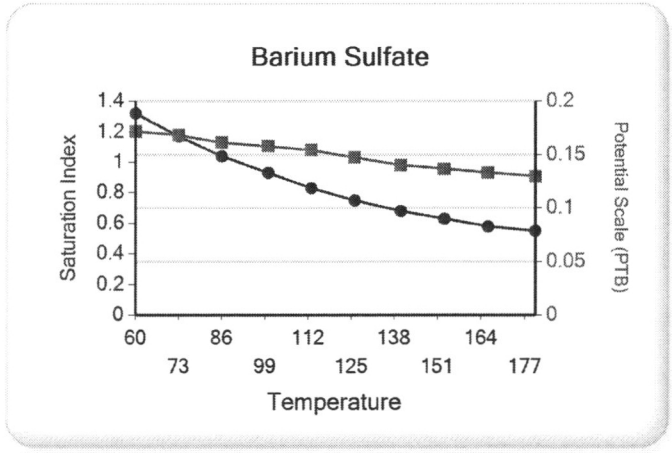
Water Analysis Report

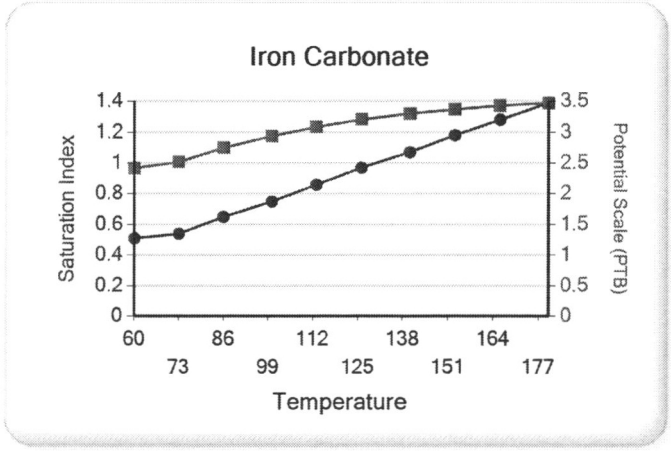
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
60.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.35
100.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	1.26
113.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23	2.02
126.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	2.61
140.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.40	3.04
153.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.01	3.34
166.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	1.00	0.00	0.00	3.64	3.55
180.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	7.28	0.00	0.00	4.28	3.68

These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate Mg Silicate Fe Silicate







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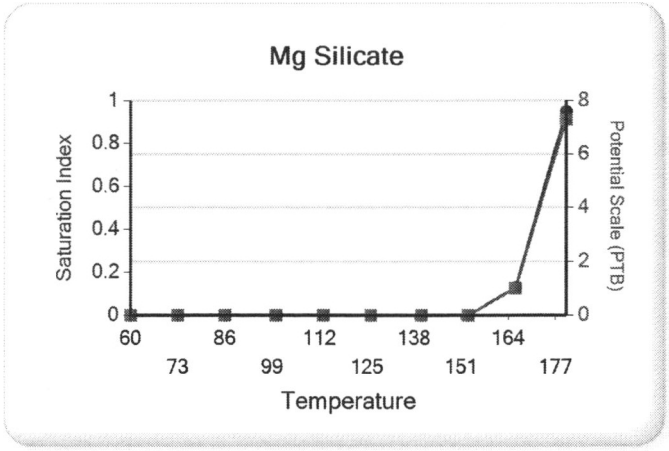
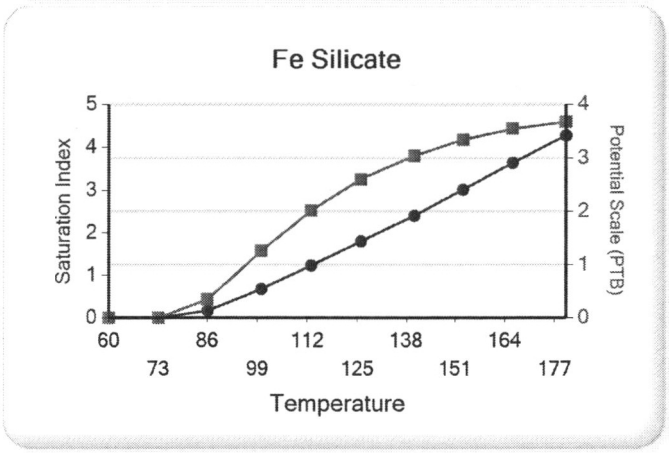
Water Analysis Report





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
999 18TH STREET - SUITE 300
DENVER, CO 80202-2466
Phone 800-227-8917
http://www.epa.gov/region08

AUTHORIZATION FOR ADDITIONAL WELL

UIC Area Permit No: UT20736-00000

The Antelope Creek Waterflood Final UIC Area Permit No. UT20736-00000, effective July 12, 1994, authorizes injection for the purpose of enhanced oil recovery into multiple lenticular sand units which are distributed throughout the lower portion of the Green River Formation. On December 27, 2004, the permittee provided notice to the Director concerning the following additional enhanced recovery injection well:

Well Name:	**Ute Tribal 18-01**
EPA Well ID Number:	**UT20736-06700**
Location:	550 ft FNL & 521 ft FEL NE NE Sec. 18 - T5S - R3W Duchesne County, Utah.

Pursuant to 40 CFR §144.33, Area UIC Permit No. UT20736-00000 authorizes the permittee to construct and operate, convert, or plug and abandon additional enhanced recovery injection wells within the area permit. This well was determined to satisfy additional well criteria required by the permit.

This well is subject to all provisions of UIC Area Permit No. UT20736-00000, as modified and as specified in the Well Specific Requirements detailed below. This Authorization shall expire one year after the Effective Date unless the permittee has converted the well to injection or submits a written request to extend this Authorization prior to the expiration date.

This Authorization is effective upon signature.

Date: APR 17 2006

for **Stephen S. Tuber**
*Assistant Regional Administrator
Office of Partnerships and Regulatory Assistance

** The person holding this title is referred to as the Director throughout the Permit and Authorization*

WELL-SPECIFIC REQUIREMENTS

Well Name: **Ute Tribal 18-01**
EPA Well ID Number: **UT20736-06700**

Prior to commencing injection operations, the permittee shall submit the following information and receive written Authority to Inject from the Director:

1. a successful Part I (Internal) Mechanical Integrity test (MIT);
2. pore pressure calculation of the proposed injection zone; and
3. completed Well Rework Record EPA Form No. 7520-12 and schematic diagram.

Approved Injection Zone: Injection is approved between the base of the Green River A Lime Marker, at approximately 3720 ft $(KB)_{CBL}$, to the top of the Basal Carbonate, at approximately 5732 ft $(KB)_{CBL}$.

Maximum Allowable Injection Pressure (MAIP): The initial MAIP is **1470 psig,** based on the following calculation:

MAIP = [FG - (0.433)(SG)] * D, where
FG = 0.80 psi/ft SG = 1.002 D = **4026 ft** (top perforation depth KB)
MAIP = 1470 psig

UIC Area Permit No. UT20736-00000 also provides the opportunity for the permittee to request a change of the MAIP based upon results of a step rate test that demonstrates the formation breakdown pressure will not be exceeded.

Well Construction and Corrective Action: ***The following Corrective Action is required.***
The cement bond log did not provide evidence that the an effective barrier exist to significant upward movement fluid movement through vertical channels adjacent to the injection well bore. Therefore the operator shall demonstrate Part II Mechanical Integrity within one-hundred and eighty (180) days after commencing injection and at least once every five (5) years thereafter using a temperature survey, noise log, oxygen activation log, or a radioactive tracer survey under certain circumstances.
The permit limits the injection zone to "the gross interval **within the Green River Formation**", which is between the approximate depths of 3750 ft and 5850 ft $(KB)_{CBL}$. Therefore, prior to injection, the existing open perforations above the Confining Zone (GG4) from 2490 ft (KB) to 2544 ft (KB) shall be cement squeezed and perforations below the Basal Carbonate from 5734 ft (KB) to 5747 ft (KB) shall be isolated or cement squeezed. Documentation for both procedures shall be submitted to the Director for review before authorization to inject will be permitted.

Tubing: ***No Corrective Action is required.***
2-3/8" or similar size injection tubing is approved; the packer shall be set at a depth no more than 100 ft above the top perforation.

Corrective Action for Wells in Area of Review: ***No Corrective Action is required.***
The following well that penetrates the confining zone is within or proximate to a 1/4 mile radius

around the Ute Tribal No. 18-01. This well was evaluated to determine if any corrective action is necessary to prevent fluid movement into USDWs:

Well: Ute Tribal No. 17-04 ● Location: NE NE Sec. 32 - T5S - R3W

Demonstration of Mechanical Integrity: ***The following Corrective Action is required.***
A successful demonstration of Part I (Internal) Mechanical Integrity using a standard Casing-Tubing pressure test is required prior to injection and at least once every five (5) years thereafter. EPA reviewed the cement bond log and was unable to determine if the cement would provide an effective barrier to significant upward movement of fluids through vertical channels adjacent to the well bore pursuant to 40 CFR 146.8 (a)(2). Therefore, further demonstration of Part II (External) Mechanical Integrity is required within one-hundred and eighty (180) days after injection begins and every five (5) years thereafter.

Demonstration of Financial Responsibility: ***No Corrective Action is required.***
The applicant has demonstrated financial responsibility in the amount of $15,000 via a Surety Bond that has been reviewed and approved by the EPA.

Plugging and Abandonment: ***The following Action is required.***
The well shall be plugged in a manner that isolates the injection zone and prevents movement of fluids into or between USDWs. Tubing, packers, and any downhole apparatus shall be removed. Class A, C, G, and H cements, with additives such as accelerators and retarders that control or enhance cement properties, may be used for plugs; however, volume extending additives and gel cements are not approved for plug use. Plug placement shall be verified by tagging after each plug is set. Plugging gel of at least 9.2 lb/gal shall be placed between all plugs. A minimum 50 ft surface plug shall be set inside and outside of the surface casing to seal pathways for fluid migration into the subsurface. Within sixty (60) days after plugging the owner or operator shall submit Plugging Record (EPA Form 7520-13) to the Director. The Plugging Record must be certified as accurate and complete by the person responsible for the plugging operation. At a minimum, the following plugs are required:

PLUG NO. 1: Set a cast iron bridge plug (CIBP) no more than 50 ft above the top perforation at 4026 ft (KB) with a minimum 20 ft cement plug on top of the CIBP.

PLUG NO. 2: Set a minimum 200 ft cement plug inside of the 5-1/2" casing across the Trona Zone and the Mahogany Shale, between approximately 2434 ft (KB) to 2634 ft (KB).

PLUG NO. 3: Set a minimum 200 ft cement plug on the inside and backside (unless pre-existing backside cement precludes cement-squeezing this interval) of the 5-1/2" casing across the Green River , between approximately 1204 ft (KB) to 1404 ft (KB).

PLUG NO. 4: Set a minimum 200 ft cement plug on the inside and backside (unless pre-existing backside cement precludes cement-squeezing this interval) of the 5-1/2" casing across the USDW, between approximately 855 ft (KB) and 1055 ft (KB).

PLUG NO. 5: Set a minimum 50 ft cement plug on the backside of the 5-1/2" casing, across the surface casing shoe at 428 ft (KB) (unless pre-existing backside cement precludes cement-squeezing this interval.)

PLUG NO. 6: Set a cement plug inside of the 5-1/2" casing, from at least 403 ft (KB) to 453 ft (KB).

PLUG NO. 7: Set a cement plug on the backside of the 5-1/2" casing, from surface to a depth of at least 50 ft.

PLUG NO. 8: Set a cement plug inside of the 5-1/2" casing from surface to a depth of at least 50 ft.

Cut off surface and 5-1/2" casing at least 4 ft below ground level and set P&A marker; submit Sundry Notices and all necessary data as required by the EPA and other regulatory agencies.

Reporting of Noncompliance:

(a) Anticipated Noncompliance. The operator shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(b) Compliance Schedules. Reports of compliance or noncompliance with, or any progress on, interim and final requirements contained in any compliance schedule of this Permit shall be submitted no later than thirty (30) days following each schedule date.

(c) Written Notice of any noncompliance which may endanger health or the environment shall be reported to the Director within five (5) days of the time the operator becomes aware of the noncompliance. The written notice shall contain a description of the noncompliance and its cause; the period of noncompliance including dates and times; if the noncompliance has not been corrected the anticipated time it is expected to continue; and steps taken or planned to prevent or reduce recurrence of the noncompliance.

Twenty-Four Hour Noncompliance Reporting:

The operator shall report to the Director any noncompliance which may endanger health or environment. Information shall be provided, either orally or by leaving a message, within twenty-four (24) hours from the time the operator becomes aware of the circumstances by telephoning 1.800.227-8917 and asking for the EPA Region 8 UIC Program Compliance and Enforcement Director, or by contacting the Region 8 Emergency Operations Center at 303.293.1788 if calling from outside EPA Region 8. The following information shall be

included in the verbal report:

(a) Any monitoring or other information which indicates that any contaminant may cause an endangerment to a USDW.

(b) Any noncompliance with a Permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

Oil Spill and Chemical Release Reporting:

The operator shall comply with all other reporting requirements related to oil spills and chemical releases or other potential impacts to human health or the environment by contacting the **National Response Center (NRC) 1.800.424.8802 or 202.267.2675,** or through the **NRC website at http://www.nrc.uscg.mil/index.htm.**

Other Noncompliance:

The operator shall report all other instances of noncompliance not otherwise reported at the time monitoring reports are submitted.

Other Information:

Where the operator becomes aware that he failed to submit any relevant facts in the Permit application, or submitted incorrect information in a Permit application, or in any report to the Director, the operator shall submit such correct facts or information within two (2) weeks of the time such information became known to him.

WELL-SPECIFIC CONSIDERATIONS

Well Name: **Ute Tribal 18-01**
EPA Well ID Number: **UT20736-00000**

Underground Sources of Drinking Water (USDWs): USDWs in the Antelope Creek Waterflood area generally may occur within the Uinta Formation, which extends from the surface to the top of the Green River Formation at approximately 1304 ft below ground surface. According to *"Base of Moderately Saline Ground Water in the Uinta Basin, Utah, State of Utah Technical Publication No. 92,"* the base of moderately saline ground water may be found at approximately 175 ft below ground surface at this well location. Petroglyph Operating Company reported that the base of the USDW is at 955 ft (KB). Based on a cement volume calculation, enough cement was used to cement the casing to up to the surface. However, the cased hole cement log, as analyzed by Petroglyph, shows the top of continuous casing cement at approximately 1,986 ft and shows variable quality of the downhole cement. Therefore, EPA will require demonstration of Part II (External) Mechanical Integrity through the operation life of the well, and has amended the plugging and abandonment plan to include a cement squeeze plug outside of the casing across the base of USDW's at 955 ft KB.

Confining Zone: The Confining Zone at this location is approximately 214 ft of interbedded limestone and shale between the depths of 3506 ft to 3720 ft (KB) which directly overlies the Injection Zone, based on correlation to the Antelope Creek Ute Tribal 04-03 well Type Log. Additional impermeable lacustrine shale beds above the Confining Zone provide for further protection for any overlying USDW.

Injection Zone: The Injection Zone at this well location is an approximately 2012 ft section of multiple lenticular sand units interbedded with shale, marlstone and limestone from the base of the Confining Zone at 3720 ft (KB) to the top of the Basal Carbonate Formation at 5732 ft (KB), based on correlation to the Antelope Creek Ute Tribal 04-03 well Type Log.

Well Construction: The CBL provided was not useful for the evaluation of cement bonding.

Surface casing:	8-5/8" casing is set at 428 ft (KB) in a 12-1/4" hole, using 250 sacks cement circulated to the surface.
Longstring casing:	5-1/2" casing is set at 6293 ft (KB) in a 7-7/8" 6534 ft Total Depth hole with a plugged back total depth (PBTD) of 6224 ft, cemented with 1450 sacks cement. Top of Cement (TOC): 1986 ft (KB) *cased hole cement log*
Perforations:	top perforation: **4026 ft** (KB) Bottom perforation: **5702 ft** (KB)

PRIOR TO INJECTION the open perforations above the Confining Zone from 2490 ft to 2544 ft shall be cement squeezed; and the open perforations in the Basal Carbonate from 5734 ft to 5747 ft shall be isolated or cement squeezed.

Wells in Area of Review (AOR): Construction and cementing records, including cement bond logs (CBL) as available, for one well in the 1/4 mile AOR that penetrated the confining zone was reviewed and found adequate to prevent fluid movement out of the injection zone and into USDWs.

Well: Ute Tribal No. 17-04 ● Casing Cement top: 1864 ft (KB) $_{CBL}$